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Hybrid and Alternative Fuel Vehicles

INTRODUCTION

King County has been a leader in investing in new technologies, from alternative fuel vehicles in the 1990s, to hybrids in the last decade,

USAGE HISTORY & EXPERIENCE

Transportation is the largest source of greenhouse gas emission in King County, accounting for nearly half of all GHG emissions that occur within King County's geography. In the region, GHG emissions from transportation result from burning gasoline, diesel, natural gas, and other types of fossil fuels. King County is continually working to improve vehicle technology, phase in cleaner fuels, and reduce emissions through thoughtful operating practices for both Metro Transit and an extensive vehicle fleet that supports government functions.

Metro Transit has been a leader in deploying fleet vehicles that utilize new technologies and reduce fuel use. Metro Transit operates one of only five electric trolley systems in the U.S., and in 2015, began updating its trolley fleet with vehicles designed to travel "off-wire" for limited distances with regenerative braking and improved energy efficiency. In 2014, Metro Transit began purchasing new hybrid buses with all electric drive components and accessories, enhanced fuel efficiency and the ability to completely cut off the engine when there is no need for power. Metro Transit was also the first transit agency in the nation to invest in articulated hybrid buses and all-electric zero-emission cars for the *metropool* commuter van program.

Metro Transit will deploy two zero-emission technologies and begin the conversion of its Access fleet to alternative fuels in 2015. They will also launch a zero-emission, all-electric battery powered bus pilot – with fast-charge stations – and liquid petroleum gas (propane)-fueled Access vans in 2015-2016. Fleet Administration and DNRP are also seeking and implementing new low GHG technologies, and Rideshare Operations is evaluating the potential to acquire the Chrysler plug-in hybrid minivan (due for release in 2016) which could drastically cut fuel use and GHG emissions for the commuter van fleet.

Flexible Fuel Vehicles

Fleet Division purchases flexible-fuel vehicles (FFV), including police cars and propane-powered vehicles. Metro Rideshare Operations purchases alternate fuel passenger vans. Most of these vehicles are equipped to use ethanol, gasoline, or "E85," the term for fuel blends of 85 percent ethanol and 15 percent gasoline. Using E85 reduces carbon dioxide (CO_2), hydrocarbon and benzene emissions when compared to vehicles running on gasoline.

Propane-Powered Vehicles

Fleet has placed several liquid petroleum gas (LPG or propane) pickup trucks in service. The incremental costs for the factory-approved conversions were paid for with American Reinvestment and Recovery Act funding obtained through Clean Cities Coalition and the Department of Energy.

Hybrid Vehicles

Since 2001, King County has purchased hybrid electric vehicles (HEVs) to replace older model vehicles as they are retired. Hybrids are fuel-efficient and contribute less to greenhouse gas emissions. The County currently purchases Ford, Nissan and Toyota brands for various fleets. Accessible Services purchased and put into operation hybrid Access mini buses. As of 2015 King County's Hybrid vehicles are 20% more fuel efficient than previous hybrids purchased in 2011.

Electric Vehicles

The Department of Transportation purchased 25 electric cars in 2011 – 20 for Rideshare Operations and five for the Motor Pool fleet.

Metro Rideshare Operation's purchase of 20 Nissan Leafs was used to pilot electric vehicle (EV) technology in a commuter application called "Metropool" and coordinate the installation of charging stations at major employer sites and multi-modal transportation hubs such as Park & Rides, train stations and ferry terminals. This program alone has saved more than 30,000 gallons of gas and eliminated more than 300 metric tons of emissions in 2014.

A joint contract issued by the City of Seattle and King County was established to purchase charging station equipment for the electric vehicles which has been integral in establishing these throughout the region. As of late 2015, King County is currently partnering with installers to add 40 publicly accessible Level 3 Electric Vehicle charging stations to encourage travel alternatives.

Hybrid Trucks

Fleet has purchased several specialty hybrid trucks, including one with an aerial lift and one for mobile lubrication. These hybrids all have the unique capability to operate lift/tow/fill functions in electric only mode, so the engine does not have to be idling. "We're easily seeing a 30 percent fuel savings with the new hybrid trucks," said Fleet Equipment Manager. "They have been performing at or above our expectations in all areas."

Hybrid Buses

As of March 2015, almost 70 percent of Metro Transit's motorbus fleet was hybrid or electric. Metro Transit has received many Federal Transit Administration awards throughout the years to offset the cost to purchase these hybrid diesel-electric buses that are 30 percent more efficient than the replaced conventional diesel buses that have reached the end of their useful lives. In 2014, Metro Transit began purchasing new hybrid buses with all electric drive components and accessories, enhanced fuel efficiency and the ability to completely cut off the engine when there is no need for power.

Bid and Contract Specifications

King County purchases most of its vehicles, including alternative and flexible fuel vehicles (FFV) through contracts maintained by the State of Washington. The State consults with political subdivisions to estimate how many vehicles will be purchased and plan their bids accordingly.

State of Washington contracts:

Vehicles, Automobiles, Sedan (Compact, Midsize, Full-size) and Alternative (Electric & Hybrid) contract #03513

2017 Chevrolet Volt Plug In Hybrid Electric Vehicle (PHEV)

2017 Fusion Hybrid 4-Door Sedan, S Trim

2017 Fusion Energi Plug-In Hybrid, 4-Door Sedan, SE Trim

2016 C-Max Hybrid 5-Door Hatchback

2016 C-MAX Hybrid Plug-In Energi 5-Door

2016 Focus Electric 5-Door Hatchback

2016 Nissan Leaf

2015 Fusion Hybrid 4-Door sedan, "S" Trim

2015 C-Max Hybrid 5-Door Hatchback

2015 Civic Hybrid

2015 Nissan Leaf

2015 Prius (TWO)

2015 Camry Hybrid

King County:

King County established a contract for propane powered pickup truck and propane fuel systems in 2015:

Propane Powered Pickup Truck and Propane Fuel Systems (2015)

Vendors – Creative Bus Sales, Inc dba Green Alternative and Northside Ford Trucks

Schedule #1 - Vehicles

Item #1 - 2015 Ford Super Duty F-250 pickup, 3/4 ton, 9,900 lb GVWR, 4x2, regular cab, 6.2L V-8 gas engine, Roush liquid propane fuel system with under-bed tank

Item #2 - 2015 Ford Super Duty F-350 pickup, 1 ton, 10,000 lb. GVWR, 4x2, regular cab, 6.2L V-8 gas engine, Roush liquid propane fuel system with under-bed tank

Item #3 - 2015 Ford Super Duty F-350 pickup, 1 ton, 10,300 lb. GVWR, 4x2, regular cab, 6.2L V-8 gas engine, Roush liquid propane fuel system with under-bed tank

Schedule 2 - Propane Kits

In addition to the purchase of propane powered vehicle list above, King County, Accessible Services wishes to purchase 25 Roush propane KITS to modify existing vehicles in their fleet. The vehicles to be converted are 2014 Ford E-450 chassis with paratransit passenger conversions. These chassis are all equipped with 6.8 liter V-10 gas engines. King County may at a later date decide to convert an older group of vans which are 2011 E-450 chassis with 5.4 Liter engines. King County will perform the propane conversion within their own shop.

FOR MORE INFORMATION

- King County Department of Transportation
- National Renewable Energy Lab - Hybrid Electric & Fuel Cell Vehicles
- King County Climate Change Commute Solutions
- How Hybrid Cars Work
- US Department of Energy - Alternative Fuels & Vehicles

VENDOR INFORMATION

- Toyota Prius
- Ford Escape SUV hybrid
- Honda Civic CNG
- Nissan Leaf
- A123 Systems – lithium ion batteries for PHEV
- Hybrid bus models
  - New Flyer
  - Orion
  - Gillig
  - Allison Transmissions